Attorney's Docket No.: 10559/859001
Intel Corporation

REMARKS

Reconsideration and allowance of the above-amended application are respectfully requested.

Claims 1 and 27 have been amended to include features originally recited in Claims 3 and 28, respectively. Claim 17 has also been amended. Claims 3 and 28 have now been canceled. Upon entry of the above amendment, Claims 1, 2, 4-27 and 29 are pending and patentable.

Leonard has been cited under 35 USC 102(b) to reject original claims 1, 2, 6-9, 12-16, 12-22, 24, 27 and 29. Combinations of Leonard with Lide, Ramdani, Oh and Domash have bee been cited under 35 USC 103(a) to reject other claims as originally filed. Claims 1, 17 and 27 have been amended and are thus patentable over the cited prior art.

Claim 1 as amended, for example, recites the waveguide cladding shaped to enclose around said waveguide core. This feature ensures that the waveguide core is sufficiently clad by the waveguide cladding to confine the waveguide modes spatially. In addition, Claim 1 as amended recites "said waveguide core has a high refractive index from about 3.4 to about 3.6, and said waveguide cladding has a low refractive index from about 1.4 to about 2.4." Hence, the difference in the refractive indices between the core and cladding can be greater than 1 and thus has

a high index contrast with respect to other optical waveguides. This combination of physical confinement of the waveguide core by the waveguide cladding and the high index contrast allows the waveguide to be small and to support highly confined optical modes to allow for integrated devices. To illustrate, such high-contrast waveguides can have a dimension in the cross section about 0.5 x 0.5 microns for the optical wavelength at 1.55 micron. This compact nature of the high-contrast and well confined waveguides allows many devices to be integrated on a chip, allows small waveguide bend radius possible to achieve a high packaging density, more flexibility in optical circuit designs, permits control electrodes to be spaced close together with minimum optical scattering loss and a low operating voltage to generate a sufficient electric field to control the device.

The cited Leonard discloses in FIG. 8 and other figures that a waveguide core 34 formed of PSG (n~1.46) is formed between SiO_2 (n~1.45) cladding layers 32 and 36. The index difference here is much less than 1. Such waveguides with a low index contrast have dimensions on the order of 10 x 10 microns in the cross section for single-mode waveguides at the optical wavelength of 1.55 micron. Such waveguides are difficult to form integrated devices on chips and to provide other features stated above in connection with Claim 1 as amended.

In addition, the design in FIG. 8 disclosed by Leonard has an EO cladding region on top of the core 34 in a gap in the top SiO2 cladding layer 36. Hence, the core 34 is mainly clad by the SiO2 cladding layer 36. Such designs lack the physical confinement and high index contract in the recited combination in Claim 1.

Therefore, Claim 1 as amended is distinctly different from Leonard and is patentable.

Other references by Lide, Ramdani, Oh and Domash are cited to fill various voids left by the disclosure of Leonard. However, the proposed combinations of Leonard and other references are silent with respect to the above stated features in Claim 1 as amended. In addition, none of the cited references including Leonard addresses the needs of small waveguides with highly confined optical modes for integrated devices. Nothing in the Office Action suggest there's any motivation or suggestion to make the proposed combinations as alleged in the Office Action. Under 35 USC 103(a), the rejections are improper and thus must be withdrawn.

Other claims are patentable over the cited prior art based on the above reasons presented for Claim 1 and on their own merits.

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In view of the above, Applicants ask that all claims be allowed. Please apply all applicable charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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